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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/599,252	04/20/2007	A. Paul Alivisatos	IB-2012	6279
8076	7590	08/12/2009	EXAMINER	
LAWRENCE BERKELEY NATIONAL LABORATORY Technology Transfer & Intellectual Property Management One Cyclotron Road MS 56A-120 BERKELEY, CA 94720			HITESHEW, FELISA CARLA	
		ART UNIT		PAPER NUMBER
		1792		
		MAIL DATE	DELIVERY MODE	
		08/12/2009	PAPER	

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>
	10/599,252	ALIVISATOS ET AL.
	<b>Examiner</b>	<b>Art Unit</b>
	Felisa C. Hiteshew	1792

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

1) Responsive to communication(s) filed on \_\_\_\_\_.  
 2a) This action is FINAL.                    2b) This action is non-final.  
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

4) Claim(s) 1-27 is/are pending in the application.  
 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.  
 5) Claim(s) \_\_\_\_ is/are allowed.  
 6) Claim(s) 1-27 is/are rejected.  
 7) Claim(s) \_\_\_\_ is/are objected to.  
 8) Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

9) The specification is objected to by the Examiner.  
 10) The drawing(s) filed on \_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All    b) Some \* c) None of:  
     1. Certified copies of the priority documents have been received.  
     2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
     3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

1) <input type="checkbox"/> Notice of References Cited (PTO-892)	4) <input type="checkbox"/> Interview Summary (PTO-413)
2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	Paper No(s)/Mail Date. _____ .
3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date <u>05/09/2007</u> .	5) <input type="checkbox"/> Notice of Informal Patent Application
	6) <input type="checkbox"/> Other: _____

## DETAILED ACTION

### ***Information Disclosure Statement***

The PTOL 1449 of 05/09/2009 has been received, reviewed and considered.

### ***Claim Rejections - 35 USC § 102***

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 1-4 and 7-27 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 7,381,465 (Torimoto, et al).

Torimoto, et al teaches a core-shell structure comprising a shell and a nanoparticle inside the shell and a space between the shell and the nanoparticle. See col. 2, lines 54-62. The shell has a thickness that permits passing of solute and solvent (col. 4, lines 3-8) which would necessarily be within 1 nm to tens of nm. The first material comprises Si and the second material comprises sulfur (S). See col. 7, line 60 to col. 8, line 8. Because they are chemically different, they have different diffusion rate. (Claims 13-14). Torimoto teaches a method of making a core-shell structure having a void space inside a shell by coating the surface of the core particle with a first component material and reacting the first component material with a second component material to form the shell. See col. 3, lines 27-45. (Claim 21). The first material comprises Si and the second material comprises sulfur (S). See col. 7, line 60 to col. 8, line 8. Because they are chemically different, they have different diffusion rate. (Claims 22-24; and Claims 25-27: See col. 3, line 27 to col. 4, line 7.

***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 1-4, 7-12 and 16-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Luo, et al (Journal of Crystal Growth (2005), 285(4), pgs 534-540).

Luo. et al teaches Cuprous oxide (CuO) nanocrystals with tubular cubic and hollow cubic morphologies were obtained in simple solution-phase reduction system using nonionic surfactant octylphenyl ether (Triton X- 100) as solvent. Uniform single crystal nanotubes with outer diameters or approximately 20 nm. an inner diameter of approximately 10 nm and lengths of approximately 120 nm were prepared through reduction of CuCl<sub>2</sub> by glucose.

The difference being that Luo. et al does not teach a hollow nanocrystal, wherein: the shell comprises a material selected from the group consisting of Pt. ZnS. Zn, Se. etc.), However. in the absence of unobvious results, it would have been obvious to one of ordinary skill in the art optimize and modify the process and product limitation in order to ensure proper orientation.

5. Claims 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 7,381,465 (Torimoto, et al)

Torimoto teaches metal as the material for the particulate nanocore (col. 2, lines 65-66). Platinoid and noble metals are known to be one of the best materials for catalyst. Therefore, it would have been obvious to one of ordinary skill in the art to have been motivated to select Pt as the metal for the nanoparticle of the core-shell structure or “hollow” of Torimoto, et al.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Felisa Hiteshew whose telephone number is (571) 272-1463. The examiner can normally be reached on Mondays through Thursday from 5:30 AM to 4:00 PM with Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mikhail Kornakov, can be reached on (571) 272-1414. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-1463.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866- 217-9197 (toll-free).

/Felisa C. Hiteshew/  
Primary Examiner, Art Unit 1792